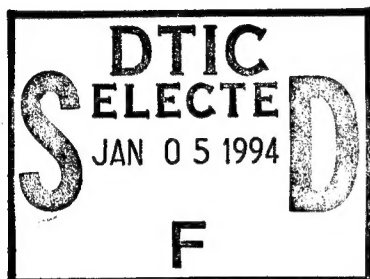


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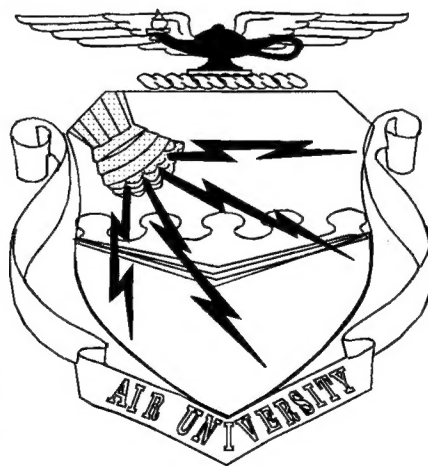
Missing Depot Level Reparables in
Air Force Depot Maintenance Repair



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Class

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PMCS IDEA PAPER

TITLE: MISSING DEPOT LEVEL REPARABLES IN AIR FORCE DEPOT MAINTENANCE REPAIR

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EXECUTIVE SUMMARY

The Air Force has not resolved all problems since the implementation of stock funding for depot level reparables (DLRs). In this paper I discuss one of those problem areas that directly impacts depot maintenance. The depots are impacted because of legitimate actions taken by base maintenance and supply activities. Air Force depots currently are paying to replace DLRs missing from larger DLRs which were returned to the depots by base activities.

In this paper I discuss how this problem is caused by a broken process that was not fixed when the Air Force implemented stock funding for DLRs. I further provide potential solutions for this problem. I believe that this problem can and should be resolved as quickly as possible.

I recommend that HQ USAF/LGSP (Supply/Fuels Policy Division) and HQ USAF/LGSY (Aircraft/Missile Support Division) take action and modify the current procedure that the depot has no visibility of DLR turn-in transactions made from base maintenance activities by making the transactions both visible and usable by the depots. If the Air Force accomplishes this, the broken process will be fixed.

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TABLE OF CONTENTS

INTRODUCTION	1
DISCUSSION	2
BACKGROUND	2
PROBLEM PRESENTATION	2
Example One	2
Example Two	3
Problem Definition	3
Depot Maintenance Cost Burden to Replace Missing Items	4
PROPOSED SOLUTIONS	4
FINANCIAL SOLUTIONS	4
Option One	4
Option Two	5
Option Three	5
Analysis	5
SUPPLY SOLUTIONS	6
Option One	6
Option Two	7
Option Three	7
Analysis	8
CONCLUSION	8
RECOMMENDATION	9
Bibliography	10
Appendix A RSD Definitions	11
Appendix B RSD Costing/Pricing Formulas	13
Appendix C How the RSD Process Works	14
Chart: Completed Base Exchange Process	15
Chart: Non-Completed (broken) Exchange Process between the Base and the Depot	16
Chart: Completed Exchange Process between the Base and the Depot	17

INTRODUCTION

As a depot repair technician on the repair line begins repair action on a computer from the F-16 aircraft, he quickly discovers that two of the internal circuit cards are missing. As in the past, the technician starts to ask the some questions. "How did this happen?" "What organization pays to replace it?" "What procedure do I follow to replace it?" "When will someone solve this problem?" Our repair technician continues to mutter that it was so easy before the Air Force put depot level reparable (DLRs) into a stock fund. Now the whole world has gone crazy.

DMRD 904 mandated the stock funding of DLRs, and the Air Force implemented this concept on 1 October 1992. This action took all funding for DLRs out of the appropriated funds. A new stock fund organization, the Repairable Support Division (RSD), was created to manage DLRs. RSD customers now purchase DLRs from the stock fund. RSD adds a surcharge to each of its sales. The money generated by customer payments of the surcharge pays for new procurements, repair, transportation, and various overhead expenses.

As the process of planning for and then implementing the DLR stock funding concept unfolded, no one anticipated all the problems, the required policy changes, nor all the data system changes required to accommodate this concept. Situations continue to occur which require adjustments in policies, systems, and attitudes.

I am writing this paper to discuss a problem unique to Air Force depot maintenance as a result of implementing stock funding for DLRs. The depots are faced with a problem that starts with legitimate actions taken by field maintenance activities. I will present a background and specific examples to aid the reader in understanding the scenario as to why this problem occurs. After defining the DLR problem, I will discuss six potential solutions, give a conclusion, and provide a recommendation for the best proposal that the Air Force ought to pursue for the highest level of success in resolving this problem.

DISCUSSION

BACKGROUND

Nearly 100% of the changes made in depot maintenance policies and data systems to implement RSD were of a financial nature. Before RSD implementation, depot maintenance received all DLRs at no cost to depot maintenance. Depot maintenance had to implement methodology within existing data systems to process DLRs in a cost reimbursement basis. This means that depot maintenance must purchase DLRs from the stock fund, and then sell them back to individual customers through increased sales prices. Depot maintenance managers use the Depot Maintenance Business Area (DMBA) as the financial tool for depot management and costing. DMBA is a business area of the Defense Business Operations Fund (DBOF). Business areas within DBOF are required to break even each year (no profit or loss), which means that DMBA managers need to plan expenditures to match what is charged customers in order to meet the DBOF requirement.

Currently two Air Force policies exist to resolve the problem of missing DLRs. The missing item policy for the management of items subject to repair (MISTR) is the focus of my paper. An interim policy for MISTR items expired on 1 October 1994, and no policy has been directed to replace it. The missing item policy for all other types of repair is not in question at this time.

PROBLEM PRESENTATION

Example One

I start this first example with the assumption that Base A has a fleet of F-16 aircraft. One of the repair actions taken at the base is on a line replaceable unit (LRU) from the F-16. The LRU for my example is a computer. Shop replaceable units (SRUs) in this example are circuit cards contained within the larger LRU. Base maintenance personnel will remove any unserviceable SRUs from the LRU, send them to supply, and request replacements by using the Standard Base-Level Supply System (SBSS) All Air Force base maintenance and base supply activities use the SBSS. When base supply receives the

replacement serviceable SRUs, they will be sent to base maintenance for installation in the LRU. The unserviceable SRUs returned to depot supply by the base will be inducted by depot maintenance for repair.

The scenario described in the preceding paragraph is played out numerous times each day.

Example Two

I will now change the first example and assume that after Base A has shipped the unserviceable SRUs and made a request for serviceable replacements, base repair technicians discover the LRU to be deficient in another manner. To repair the LRU is beyond the ability of base maintenance. In response, the LRU Item Manager (IM) directs the base maintenance activity to return the entire unserviceable LRU to depot supply as a not reparable this station (NRTS) for repair action by the depot. When base maintenance technicians return the unserviceable LRU and request a serviceable LRU replacement, they will also delete the outstanding requisitions they made earlier for the replacement serviceable SRUs. If the base did not cancel these requisitions, they would be obligated to pay for the SRUs when they arrive. Base managers will not want to do this. The requirement for the serviceable SRUs was voided once the unserviceable LRU was shipped out NRTS.

Appropriate technical orders for base maintenance and regulations for base supply cover the return of DLRs to depot supply by base activities.. These directives do not prohibit any base from shipping an LRU to the depot with missing SRUs. As a procedure it has been in place for many years and served all organization needs when no one paid for DLRs.

Problem Definition

Now that the Air Force has implemented stock funding for DLRs, the occurrence of the preceding second example creates a financial problem. The problem created is that a depot repair technician will open the LRU during the repair process and find that the SRUs are missing. RSD policies direct that depot maintenance return the DLR to supply in a serviceable condition. To make the DLR serviceable requires that the missing SRUs be replaced. Depot maintenance is not the organization responsible for the SRUs being missing, but depot maintenance is now the organization responsible to replace them. This responsibility means a financial burden.

Depot Maintenance Cost Burden to Replace Missing Items

There are two distinct costs that depot maintenance may pay to buy a DLR from the stock fund. Most of the DLR purchases by depot maintenance take place because a requirement exists to replace an unserviceable DLR for a serviceable DLR. For this transaction, DMBA pays the exchange price. (See Appendix B for an explanation of RSD pricing.) If, however, depot maintenance does not have an unserviceable DLR to turn back into supply, DMBA pays the standard price. When DMBA financial managers prepare the budget, it is done under the assumption that purchases will be done at the exchange price. DMBA managers put the exchange cost into the sales prices used to charge depot customers for repair services performed. The additional carcass price that is incurred to replace a missing item is not a budgeted cost and so it is not included in DMBA sales prices. OSD requires that DMBA sales prices remain constant throughout the fiscal year which restrains the ability of DMBA managers to get additional reimbursement from repair customers. This stabilized pricing concept means that DMBA will be required to absorb the additional cost as a loss.

PROPOSED SOLUTIONS

FINANCIAL SOLUTIONS

I suggest three options for solving the missing item problem by changing financial policies and procedures.

Option One

Require the RSD stock fund to issue the missing DLRs to depot maintenance without charge to the DMBA.

PRO: For depot maintenance this is positive because DMBA assumes no financial responsibility to replace the SRU.

CON 1: This is a negative situation for the RSD stock fund as it assumes the total cost for the replacement SRUs. This cost will be included in future higher surcharges which raises costs to all users.

CON 2: Currently no data system procedures are in place to accomplish this proposal.

Option Two

Require that depot maintenance requisition the missing SRUs and pay the full standard price.

PRO. When base maintenance returns unserviceable SRUs to supply, there is no financial cost involved to either the base or to the stock fund. In this option the RSD stock fund receives the benefit of an asset received from base maintenance and the extra financial benefit of the carcass price payment from DMBA to replace the SRU.

CON: This is a negative situation for DMBA as it assumes the total cost for the replacement SRUs. DMBA financial managers set sales prices to capture the exchange price from customers. The added carcass price charged to DMBA is at a full loss to DMBA, and the additional cost will be included in future sales prices which raises costs to all users.

Option Three

Require the stock fund to establish a new RSD cost code "Q" for depot maintenance only. Depot maintenance personnel will use this cost code to replace missing SRU assets. The use of cost code "Q" will generate a bill to DMBA for the exchange price. The rationale for charging exchange price instead of the standard price is that the base maintenance activity returned the unserviceable LRU to the depot and then canceled the requisitions for the serviceable SRU replacements. The RSD stock fund has not issued a serviceable SRU to any organization to complete this transaction.

PRO 1: Depot maintenance receives advantage of the earlier SRU returned by base maintenance, pays the exchange price, and assumes no additional financial burden.

PRO 2: Financial responsibility for payment of the SRU is kept with the DMBA.

CON 1: Financial and supply data systems will require extensive changes.

CON 2: Management will need to institute system, policy and other internal controls to prevent abuse.

ANALYSIS:

My position is that Options One and Two are flawed. Both put an unnecessary financial encumbrance on organizations that should not be so unfairly burdened. I recommend option three as a

financial solution. DMBA would have incurred the cost of replacing the unserviceable SRU at the exchange price if the SRU were not missing. This proposal allows for DMBA to pay its fair cost in performing repair, and not be penalized for actions beyond the control of depot maintenance.

The new cost code proposal also completes the cycle of exchanging an unserviceable DLR for a serviceable DLR. When base maintenance canceled their original requisitions requesting serviceable SRU replacements, the cycle was broken.

SUPPLY SOLUTIONS

The RSD stock fund implementation oversight committee published an implementation guide prior to the implementation of stock funding for DLRs. In the chapter devoted to depot maintenance activities is a section on missing items. The missing item section starts out by saying the following: "Current Air Force policy states that items sent to the depot for overhaul will not be sent with missing recoverable components (holes), on either management of items subject to repair (MISTR) or major end items (i.e. aircraft and engines), without prior negotiation with depot maintenance." (1:4-4) This is a significant statement but it is not correct. No such Air Force policy exists. In addition, depot maintenance has no authority to set policy for depot supply, base supply, or base maintenance. Such a policy on missing items for MISTR repair was never agreed upon by the affected organizations, nor has it been directed by HQ USAF/LGSP (Supply/Fuels Policy Division) to Air Force logistic and supply functions as Air Force policy.

I suggest three options for solving the missing item problem by changing supply policies and procedures.

Option One

Require HQ USAF/LGSP establish a policy that all DLRs will be subject to serialized control. (See Appendix A for an explanation of serialized control.) Through this method, Item Managers (IMs) will know the exact location of every DLR owned by the Air Force. SRUs will no longer lose their identity,

as they currently do, when they are installed on LRUs. Depot supply personnel will then be able to match the original SRU returned by base supply back to the same LRU also returned by base supply.

PRO: This provides for optimum control over Air Force resources.

CON 1: Currently the Air Force maintains no separate accounting identification of DLRs, nor can any data system currently accommodate this concept. To incorporate such a policy will be costly and take considerable time to build from the ground up, program, and implement.

CON 2: This expensive solution will impose new procedures and disciplines on depot supply to manage individual items. To maintain such a process will be difficult, and a SRU may be stored at a different depot than the LRU.

Option Two

Require HQ USAF/LGSP establish a policy requiring base maintenance activities return only complete LRUs to depot supply. The shipment of LRUs with missing SRUs will be prohibited.

PRO: To implement this policy will require no data system changes.

CON 1: With this policy, base maintenance will begin a process of holding onto all unserviceable SRUs until they receive back all serviceable SRUs. This action by base maintenance will cause more unserviceable DLRs to be at the bases and not at the depots where repair actions can take place. The Air Force will start to see a change in the availability of serviceable DLRs as the supply and repair processes currently in place naturally start a process of modification.

CON 2: IMs and other DLR users will have to change the methodology used to project DLR purchases and repair. This process will take several years to work out.

Option Three

Require HQ USAF/LGSP and HQ USAF/LGSY (Aircraft/Missile Support Division) jointly establish a policy that any LRUs returned to the depot in a NRTS condition have appropriate documentation attached so that the original transaction used by base maintenance to return the unserviceable SRUs can be matched with the depot maintenance requisition for the replacement SRUs.

PRO: This action will complete the process in a logical format that was broken when base maintenance canceled their requisition for the replacement serviceable SRUs.

CON 1: This process is dependent that accurate and complete manual information is attached to the unserviceable LRU. To make the base and depot transactions compatible, some data system changes are required. Currently, the D035K (depot supply) system will not recognize the base maintenance transaction rendering it unusable by depot maintenance. Additional system changes for compatibility between SBSS and D035K is desirable but not required.

CON 2: The unserviceable LRU could remain in storage for weeks or months before being inducted to the depot rendering the original transaction for the return of the SRUs outdated.

ANALYSIS

My position is that Option One is not feasible. This proposal would dramatically change the face of Air Force operations to solve a problem which could be solved with a far less sweeping modification. Option Two is also negative since it will create turmoil for years in supply operations as adjustments are made across the Air Force to accommodate new realities. This proposal is sweeping in nature since it will require certain modifications in formulas and other methods used to currently predict spare requirements. I recommend option three as a supply solution. This option completes the cycle of exchanging an unserviceable DLR for a serviceable DLR started by the base activity and completed by the depot. The Air Force will need to make modifications to accommodate the differences between the base and depot transactions. However, with new and emerging computer technologies, I believe this is feasible and doable.

CONCLUSION

I wrote this paper to discuss a missing item problem that is unique to depot maintenance as a result of implementing stock funding of DLRs. The depots continue to repair MISTR assets that have missing DLRs. There is no final policy or procedure in place on how to prevent the problem or how to pay for DLRs that are missing.

In this paper I have discussed the current policies and procedures that create the depot maintenance financial problem which were already in place prior to the DLR stock funding concept, and have not been changed since.

I have discussed potential solutions from a financial perspective and from a supply perspective. Both financial and supply solutions have positive and negative repercussions. The choices for problem resolution will either create a depot financial policy twist to counteract supply policies, or an adjustment to supply policies to correct a current broken process.

The depot repair technician is still out there waiting for resolution to this problem. The inadequate guidance to either base activities or depot financial planners continues to impact that technician. Stock funding of DLRs doesn't have to be crazy.

RECOMMENDATION

I believe that this situation can be resolved from either a supply or a financial perspective. I recommend that option three of the supply solutions is the preferred method. I say this because the missing item problem is caused because of current data system incompatibilities between base activities and depot activities that were not modified to take into consideration the requirements of DLR stock funding. The situation I explain in this paper illustrates that some data system compatibility between base actions and depot actions is desirable and necessary to complete the broken process described.

I suggest that a financial resolution should not be pursued since it is a reaction to other policies established for base activities.

I recommend that HQ USAF/LGSP in conjunction with HQ USAF/LGSY take the lead to review this requirement and develop a plan for implementation.

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1. Chapter 4, "Depot Maintenance". *DMRD 904 Implementation Plan* (October 1993).

Appendix A

RSD Definitions

Cost Codes:

- B. A programmed exchange of an unserviceable DLR for a serviceable DLR.
- G. A non-programmed exchange of an unserviceable DLR for a serviceable DLR.
- K. A programmed exchange of an unserviceable DLR for a serviceable DLR. Use of this cost code limited to repair of depot maintenance equipment.
- S. A programmed non-exchange of a serviceable DLR. This cost code used to purchase DLRs for programmed initial installations.
- U. A non-programmed non-exchange of a serviceable DLR. This cost code is used to purchase serviceable DLRs for DLRs discovered missing during repair of aircraft, engines, and other like items.

Defense Business Operations Fund (DBOF): A DoD corporate entity to manage and control DoD resources through individual business areas.

Depot Level Repairable (DLR):

- A large unit of material that can be repaired. DLRs are categorized as either a SRU or a LRU.
- A DLR is called an exchangeable item and a spare item. Exchangeable because an unserviceable DLR can be exchanged for a serviceable DLR. Spare because a serviceable DLR serves as the spare to an unserviceable DLR.

Depot Maintenance: A procedure of performing maintenance and repair in depots.

Depot Maintenance Business Area (DMBA): A business area of DBOF that finances depot maintenance activities.

Line Replaceable Unit (LRU): A DLR which is the largest grouping of a DLR.

D035K System: A supply system used by depot activities to requisition and return DLRs. This system is not used by base maintenance.

Item Manager (IM): The individual responsible to manage world-wide requirements for DLRs.

Management of Items Subject to Repair (MISTR): A term commonly used in logistics to describe DLRs. DLRs are referred to as MISTR items.

Not reparable this station (NRTS): Some maintenance actions are allowable and possible within the base maintenance function. If a repair action on a LRU is initiated by base maintenance but it later is identified that repair cannot be completed due to problems beyond the scope or ability of base maintenance, the LRU is shipped to depot supply in a NRTS status.

Serialized Control: This is a proposed method to control and manage DLRs. Currently, accounting records show only the number of DLRs available in supply or repair. Serialized control will give each DLR a separate accounting identity so the exact location of the DLR will be known. An IM will know, for example, if a particular DLR is in supply, in repair, in an aircraft, on a shelf, in base supply, or in transit.

Serviceable: A DLR that is in a status ready to be used or ready for installation.

Shop Replaceable Unit (SRU): A DLR which is identified separately as a DLR but is usually found within a larger LRU.

Standard Base Supply System (SBSS): A supply system used by base activities to requisition and return DLRs. This system is not used by depot maintenance.

Stock Fund: (Supply Management Business Area (SMBA)): A business area of DBOF that manages the purchase and repair of various categories of material. There are different categories within the stock fund, but this paper is only concerned about the RSD portion of the stock fund.

Unserviceable: A DLR that needs repair action to return it to a serviceable status.

Appendix B

RSD Costing/Pricing Formulas

Forecast Acquisition Cost (FAC) - The expected cost to replace a DLR if a new procurement.

Surcharge - The cost that RSD adds to each purchase of a DLR item. The surcharge is to cover new procurements, repair, and overhead expenditures.

Repair Cost - The cost that depot maintenance charges RSD for the repair of DLRs.

Standard Price - The cost to buy a DLR if there is no exchange (unserviceable for serviceable). It is equal to the FAC PLUS the surcharge.

Carcass Price - The difference between the standard price and the exchange price. It is equal to the FAC MINUS the repair cost.

Exchange Price - The cost to buy a DLR if there is an exchange (unserviceable for serviceable). It is equal to the Repair Cost PLUS the surcharge. The exchange price is also equal to the standard price MINUS the carcass price.

EXAMPLE:

FAC	\$100.00	
Surcharge	\$15.00	
Repair Cost	\$10.00	
Standard Price	\$115.00	$(\$100.00 + \$15.00)$
Carcass Price	\$90.00	$(\$100.00 - \$10.00)$
Exchange Price	\$25.00	$(\$10.00 + \$15.00)$ OR $(\$115.00 - \$90.00)$

Appendix C

How the RSD Process Works

RSD holds serviceable and unserviceable DLRs in central warehouses at large depot facilities. If a requisition comes in for a replacement serviceable DLR, it is shipped to the user from the depot supply facility. RSD will also ship unserviceable DLRs to depot maintenance for repair.

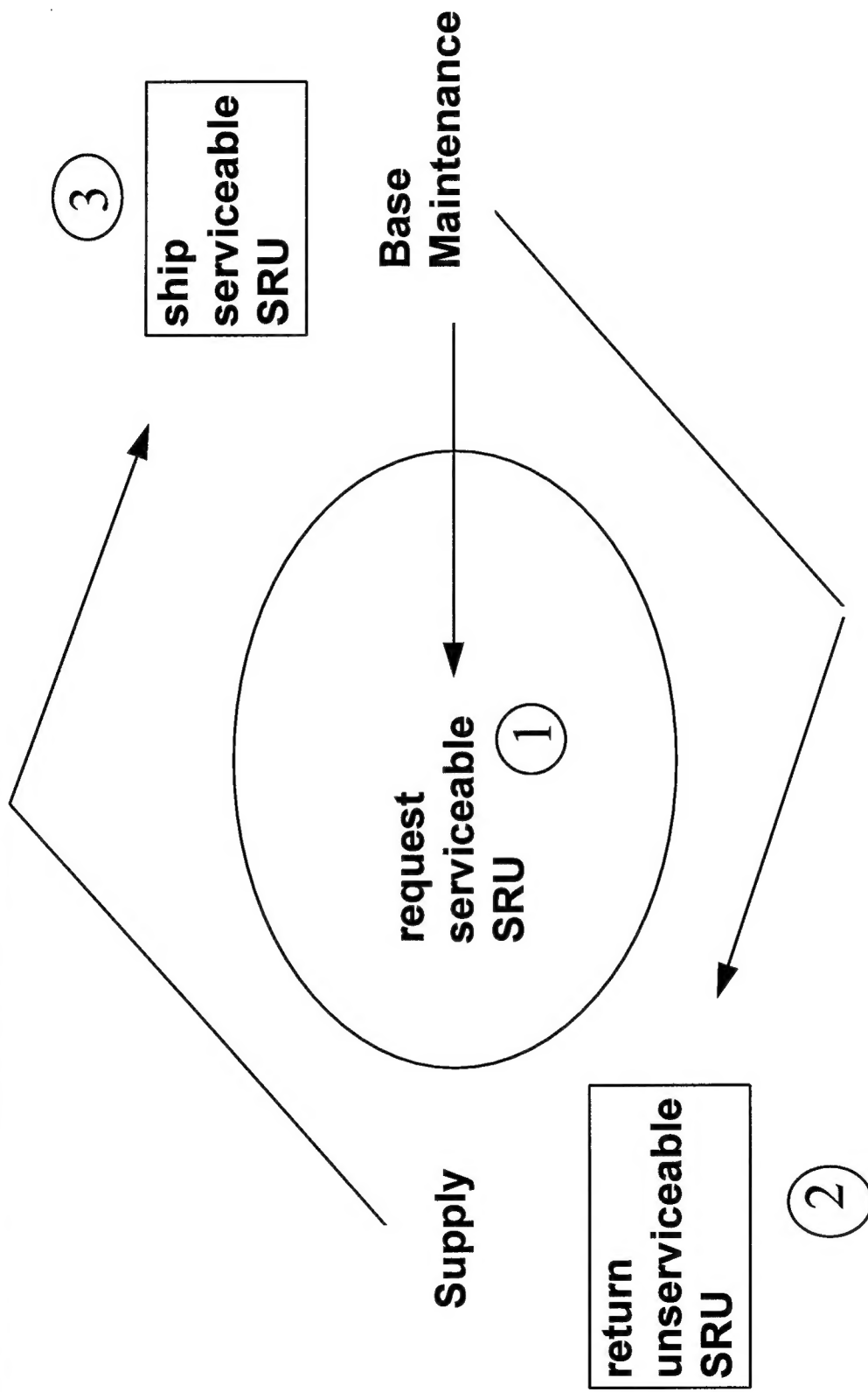
In both the SBSS and D035K systems, a transaction is input with a particular cost code which indicates the type of transaction. If cost codes "B", "G", or "K" are used, this indicates that the transaction is for an exchange of an unserviceable DLR for a serviceable DLR. If cost codes "S" or "U" are used, this indicates that the transaction is for a nonexchange which is a direct purchase of a serviceable DLR.

After a transaction with cost codes "B", "G", or "K" is completed, the maintenance activity may or may not at that time return the unserviceable DLR to depot supply. BUT, once the maintenance activity receives the serviceable DLR, there is a 60-day window to return the unserviceable DLR. If the 60 days pass without returning the unserviceable DLR, the maintenance activity receives an additional charge which equals the value of the carcass price of the DLR.

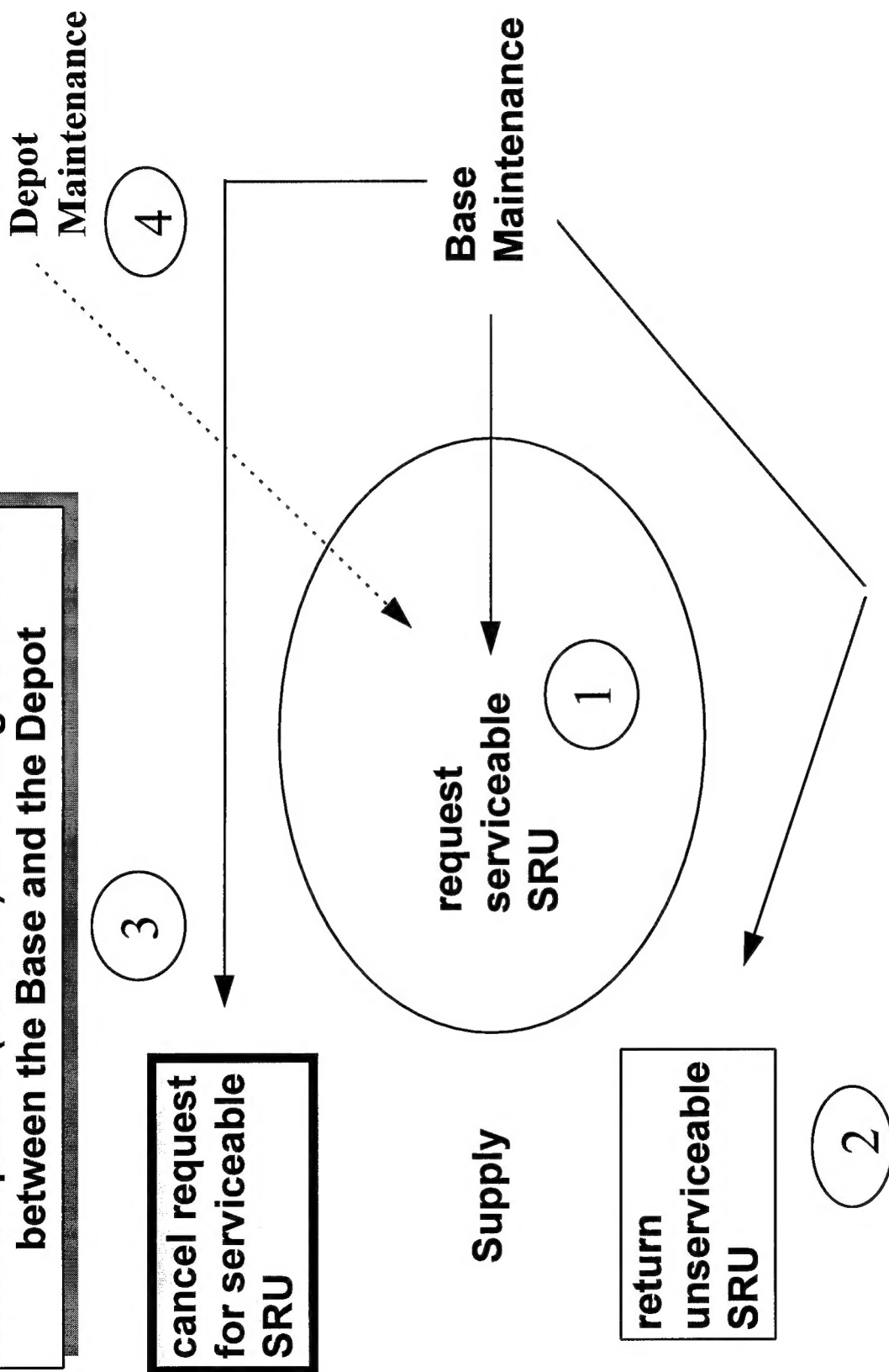
NOTE: See Appendix A for an explanation of cost code terminology.
 See Appendix B for an explanation of RSD pricing.

<u>Cost Code</u>	<u>Unserviceable Return</u>	<u>Serviceable Charge</u>	<u>60-Day Window Timing</u>	<u>Additional Charge (if past 60 days)</u>
B	yes	Exchange	yes	Carcass
G	yes	Exchange	yes	Carcass
K	yes	Exchange	yes	Carcass
S	no	Standard	no	N/A
U	no	Standard	no	N/A

Completed Base Exchange Process



**Non-completed (broken) Exchange Process
between the Base and the Depot**



**Completed Exchange Process
between the Base and the Depot**

